DR. V. S. KRISHNA GOVT. DEGREE COLLEGE (A)
VISAKHAPATNAM
DEPARTMENT OF BOTANY

PROPOSED SYLLABUS FOR B.Sc BOTANY
IN UNDERGRADUATE DEGREE PROGRAMME
UNDER AUTONOMY

2022 - 2023

BOARD OF STUDIES

IN

B.Sc BOTANY 2022-2023

SYLLABUS FOR B.Sc BOTANY

Approved in B.O.S for the Academic Year 2022-2023

(Dt : 26 - 09 – 2022)

Dr.V.S.Krishna Govt. Degree College (Autonomous),
(Accredited with 'A' Grade by NAAC)
Visakhapatnam
530013, ANDHRA PRADESH

Dr.V.S.Krishna Govt. Degree College (Autonomous), Visakhapatnam
8th Board of Studies Meeting 2022

DEPARTMENT OF BOTANY
BOS COMMITTEE 2022

Subject: Botany

In pursuance of conferment of Autonomous status to Dr.V.S.Krishna Govt. Degree College(A), Visakhapatnam by the UGC vide letter No.F22-1/2011(AC) dated 20.07.2011 from Dr. Manju Singh, Joint Secretary, UGC, New Delhi and Proceedings No. C-II (1) /Dr.V.S.Krishna College(A)/2022 dt.03.08.2022 of The Vice-Chancellor, Andhra University, Visakhapatnam, the **8th Board of Studies in Botany** Subject is conducted on 29th at 10.30 AM with the following members. The changes in the syllabus will be implemented from 2022-23 academic year onwards.

MEMBER	NAME & DESIGNATION	SIGNATURE
Head of the Department (Chairman)	Dr.P.Sreevani	
Faculty Members	Dr.TMA.Niveditha Dr.D.Apparao Dr.K.Vijayalakshmi Dr.D.S.MadhavaRao Dr.S.Padmavathi	
Subject Expert (University Nominee)	Prof.S.B.Padal Department of Botany Andhra University	
Subject Experts (from outside the parent university)	Dr.S. Radha Lecturer in Botany, GDC(M), Srikakulam	
	Dr.P.Sara Lecturer in Botany PR GDC (A), Kakinada	
Member from Industry	Dr. P. V Ramana Associate Prof, AMC, Vishakapatnam	
Member from Alumni	D.Lalitha Virajitha BZC (EM)	
Coordinator, IQAC	Dr.Ch.Lalitha	
Academic Coordinator & Member Secretary, Academic Council	Dr.P.Latha	
Principal & Chairperson, Academic Council	Dr.I.Vijaya Babu	29/9/2022

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Dr.V.S.KRISHNA GOVT. DEGREE COLLEGE(A)

(NAAC REACCREDITED A GRADE INSTITUTION & DISTRICT IDENTIFIED COLLEGE)

CENTRE FOR RESEARCH STUDIES

Maddilapalem, VISAKHAPATNAM 530 013, Andhra Pradesh

Visakhapatnam
Date: 26-09-2022

To
Dr./Sri/Smt.

Sir/Madam

Sub:-Dr.V.S.Krishna Govt. Degree College, (Autonomous), Visakhapatnam - **8th Board of Studies Meeting** in BOTANY - Invitation to attend – Request - Regarding.

Ref:- Proceedings No. C-II (1) /Dr.V.S.Krishna College(A)/2022 dt.03.08.2022 of The Vice-Chancellor, Andhra University, Visakhapatnam

* * *

I am pleased to inform you that the **Board of Studies Meeting** in Dept. of BOTANY of Dr.V.S.Krishna Govt. Degree College (Autonomous), Visakhapatnam is scheduled on 26-09-22 at 10:30 **AM**.

In this context I would like to request you to kindly make it convenient to attend the Board of Studies Meeting in the Dept. of BOTANY at Dr.V.S.Krishna Govt. Degree College (A), Visakhapatnam and the curriculum is redesigned as per the guidelines of NEP-2020.

Agenda:

1) Approval and Ratification of changes/modifications in curriculum design for 1,2,3,4,5 & 6 semesters under Choice Based Credit System from 2022-23 academic year onwards.
2) Approval of new employable and skill based programmes from 2022-23.
3) Approval of value added certificate courses for 2022-23.
4) Approval of Life skill courses and Skill development courses for 2022-23.
5) Suggestions for innovative teaching and evaluation techniques.
6) Suggestions for students' seminars, workshops and student-centered activities.
7) Suggestions for research and extension activity/start-ups.
8) Suggestions for value added certificate courses to be introduced.
9) Approval of Question Paper Blueprint and Model Question Paper for 75 External Marks and 25 Internal marks for core and language courses.
10) Approval of Question Paper Blueprint and Model Question Paper for 50 External Marks for life skill and skill development courses.
11) List of examiners.
12) Any other relevant matter.

Thanking you

Yours faithfully,

XXXXXX
PRINCIPAL

PHONE: 0891 2553262 visakhapatnam.idcollege@gmail.com FAX: 0891 2558123
Dr.V.S.KRISHNA GOVT. DEGREE COLLEGE(AUTONOMOUS)
(NAAC REACCREDITED "B"GRADE INSTITUTION (2.94CGPA) & DISTRICT IDENTIFIED COLLEGE
DISTRICT RESOURCE CENTRE & CENTRE FOR RESEARCH STUDIES
Maddilapalem, Visakhapatnam 530 013, Andhra Pradesh

Board of Studies Resolutions Adopted

The 8th Board of Studies of Department of BOTANY met on 26.09.2022 and resolved the following.

Resolved to

1. Implement the Autonomous Education System as per the Staff councils proceedings commencing from this academic year 2022-2023 for the admitted batch of Istyear degree students of 2022-23 only.

2. To implement guidelines of the academic council.

3. Approve and introduce the newly framed syllabus (modified and approved by the Board of Studies (BOS) for the first, second and final year B.Sc. Degree course in Botany. The newly framed syllabus is oriented in such a way that it caters the needs of the student and to meet the present day job employability and to develop professionalism in the fields of Botany.

4. Approve and ratify the 1st and 2nd year semester syllabus of Ist year B. Sc Degree for the admitted batch of 2020-21. Also approve and ratify the 3rd,4th,5th and 6th semesters syllabus for the academic year 2021-22 and 2022-23.

5. Ratify and introduce semester mode pattern of exam for the 1st year students Further it is approved and ratified the model question papers submitted by the concerned faculty members for all the semesters. The evaluation of internal marks is will be done for 25 marks. Mid I & Mid II will be for 50 Marks each Out of 50marks, Assignment, Seminar/Quiz, Field trips, NCC/NSS/ Clean & Green for each 10 marks, 20 marks evaluation of conducting one mid-semester examination and another Mid II for 50 marks which will be scaled down to 25 marks.

6. Conduct of remedial coaching to the slow learners.

7. To take up innovative teaching (ICT mode of teaching) wherein the method of teaching is based on audio visual lessons, Digital classroom. A separate E-class room is established in the department of Botany for this purpose.

8. To approve and ratify the Skill Development Courses, Life Skill Course and Value added Certificate add-on Course.

9. Develop infrastructure facilities to the department in order to meet SEC, SDCs and LSC.

10. Encourage young faculty members to take-up research studies and to conduct research activities

11. Adapt quality based curriculum as per the norms of the NAAC.

12. Encourage students to join JKC to equip with communication skills and improve their

Dr.V.S.Krishna Govt. Degree College (Autonomous), Visakhapatnam
Department of Botany

S. No.	Semester	Title of the Paper	Hours /week	Max. Marks	Marks in CIA	Credits
1.	Sem.-I/ Course-1	Fundamentals of Microbes and Non-vascular Plants	04	75	25	04
	Course -1 Practical	Fundamentals of Microbes and Non-vascular Plants SDC: Plant Nursery	03	Max. Marks-50 Internal assessment at Semester end		01
2.	Sem.-II/ Course -2	Basics of Vascular plants and Phytogeography CSP-I	04	75	25	04 04
	Course -2 Practical	Basics of Vascular plants and Phytogeography SDC: Fruit and Vegetable Preservation LSC: Environmental Education	03	Max. Marks-50 External assessmentat Semester end		01
3.	Sem.-III/ Course -3	Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity	04	75	25	04
	Course -3 Practical	Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity	03	Max. Marks-50 Internal assessment at Semester end		01
4.	Sem.-IV Course -4	Plant Physiology and Metabolism Internship	04	75	25	04
	Course -4 Practical	Plant Physiology and Metabolism	03	Max. Marks-50 External assessmentat Semester end		01
5.	Sem.- IV Course - 5	Cell Biology, Genetics and Plant Breeding	04	75	25	04
	Course -5 Practical	Cell Biology, Genetics and Plant Breeding	03	Max. Marks-50 External assessmentat Semester end		01
6.	Sem– V Course - – 6 & 7	Domain related Skill Enhancement Courses (02) - Three (3) pairs of courses (each pair has 2 related courses) will be offered, student has to choose a pair ofcourses.	03	75	25	04
			03	Max.Marks-50 Internal assessment at Semester end		01
			03	75	25	04
			03	Max. Marks-50 Internal assessment at Semester end		01

Skill Enhancement Course s(SECs) forSemesterV from2022-23 *(Syllabuswith Learning Outcomes, References, Co-curricular Activities & Model Q.P. Pattern)*

Structure of SECs for Semester–V

(To choose One pair from the Four alternate pairs of SECs)

Univ. Code	Course NO. 6&7	NameofCourse	Th. Hrs./ Week	IE Mar-ks	EE Mar-ks	Credits	Prac. Hrs./ Wk	Mar-ks	Credits
	6A	Plant Propagation	3	25	75	4	3	50	1
	7A	Gardening and Landscaping	3	25	75	4	3	50	1
		OR							
	6B	VegetableCrops– Cultivation Practices	3	25	75	4	3	50	1
	7B	VegetableCrops–PostHarvest Practices	3	25	75	4	3	50	1
		OR							
	6C	PlantTissueCulture	3	25	75	4	3	50	1
	7C	MushroomCultivation	3	25	75	4	3	50	1
		OR							
	6D	Seed Technology	3	25	75	4	3	50	1
	7D	Agroforestry	3	25	75	4	3	50	1

Note-1: For Semester–V, for the domain subject Botany, any one of the four pairs of SECs shall be chosen as courses 6 and 7, i.e., 6A & 7A or 6B & 7B or 6C & 7C or 6D & 7D. The pair shall not be broken (ABCD allotment is random, not on any priority basis).

Note-2: *One of the main objectives of Skill Enhancement Courses (SEC) is to inculcate skills related to the domain subject in students. The syllabus of SEC will be partially skill oriented. Hence, teachers shall also impart practical training to students on the skills embedded in syllabus citing related real field situations.*

Note3: For Semester-VI Internship for all the final year students to learn more about the skills related to the domain subject. It is onjob training (OJT).

B.Sc. Botany Syllabus
Programme Outcomes

PO 1: Knowledge and understanding of:

1. The range of plant diversity in terms of structure, function and environmental relationships.

2. The evaluation of plant diversity.

3. Plant classification and the flora of Andhra Pradesh and Visakhapatnam

4. The role of plants in the functioning of the global ecosystem.

PO 2:Intellectual skills – able to:

1. Think logically and organize tasks into a structured form.

2. Assimilate knowledge and ideas based on wide reading and through the internet.

3. Transfer of appropriate knowledge and methods from one topic to another within the subject.

4. Understand the evolving state of knowledge in a rapidly developing field.

5. Construct and test hypothesis.

6. Plan, conduct and write a report on an independent term project.

PO 3 : Practical skills:

Students learn to carry out practical work, in the field and in the laboratory. They gain introductory experience in applying each of the following skills and gain greater proficiency in a selection of them depending on their choice of optional Modules.

1. Interpreting plant morphology and anatomy.

2. Plant identification.

3. Vegetation analysis techniques.

4. A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry.

5. Analyze data using appropriate statistical methods and computer packages. 6. Plant pathology to be added for sharing of field and lab dataobtained.

PO 4: Transferable skills:

1. Use of IT (word-processing, use of internet, statistical packages and databases).

2. Communication of scientific ideas in writing and orally.

3. Ability to work as part of a team.

4. Ability to use library resources.

5. Time management. 6. Career planning.

PO 5: Scientific Knowledge: Apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form.

PO 6: Problem analysis: Identify the taxonomic positionof plants, formulate the research literature, and analyze non reported plants with substantiated conclusions using first principles and methods of nomenclature and classification inBotany.

PO 7: Design/development of solutions:

Design solutions from medicinal plants for health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health

PO 8: Conduct investigations ofcomplex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and development of the information to provide valid conclusions.

PO 9: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Anatomical studies, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations.

PO 10:The Botanist and society:

Apply reasoninginformed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.

PO 11: Environment and sustainability:

Understand the impact of the plant diversity in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainabledevelopment.

PO 12: Ethics: Apply ethical principles and commit to environmental ethics and responsibilities

and norms of the biodiversity conservation.

PO 13:: Individual and team work: Function effectively as anindividual, and as a member or leader in diverse teams, and in multidisciplinarysettings.

PO 14: Communication: Communicate effectively on present activities s in society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clearinstructions.

P O 1 5 : Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technologicalchange.

Course Outcomes of B.Sc. Botany

CO 1. Critically evaluation of ideas and collection of relevant information about the plants, so as recognize the position of plant in the broad classification and phylogenetic level.

CO 2. Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise in the field of Plant Identification.

CO 3. Accurately interpretation of collected information and use taxonomical information to evaluate and formulate a position of plant in taxonomy.

CO 4. Students will be able to present scientific hypotheses and data both orally and in writing in the formats.

CO 5. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

CO 6. Students will be able to identify the major groups of organisms with an emphasis on plants and be able to classify them within a phylogenetic framework. Students will be able to compare and contrast the characteristics of plants, algae, and fungi that differentiate them from each other and from other forms of life.

CO 7. Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped plant morphology, physiology, and life history.

CO 8. Students will be able to explain how Plants function at the level of the gene, genome, cell,

tissue, Flower development. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and mode of life cycle followed by different forms of plants.

CO 9. Students will be able to explain the ecological inter relationship of life on earth by tracing energy and nutrient flow through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.

CO 10. Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization withinbiology.

Programme Specific Outcomes: PSOs of B.Sc. Botany

Semester-I

Paper-I: Microbial Diversity, Algae and Fungi

On completion of the course, students are able to:

1. Understand the diversity amongAlgae.
2. Know the systematic, morphology and structure, of Algae. Understand the life cycle pattern ofAlgae.
3. Understand the useful and harmful activities ofAlgae.
4. Understand the Biodiversity ofFungi
5. Know the Economic Importance ofFungi

Paper II: Diversity of Archaegoniate & Anatomy

On completion of the course, students are able to:

1. Understand the morphological diversity ofBryophytes.
2. Understand the economic importance of theBryophytes.
3. Understand the morphological diversity of Bryophytes and Pteridophytes andGymnosperms.
4. Understand the economic importance of the Bryophytes and Pteridophytes andGymnosperms.
5. Know the evolution of Bryophytes and Pteridophytes and Gymnosperms.
6. Understand the habit of the angiosperm plantbody.

Semester-II:

Paper-III: Plant Taxonomy and Embryology:

On completion of the course, students are able to:

1. Know the vegetative characteristics of theplant.
2. Learn about the reproductive characteristics of theplant.
3. Understand the plant morphology and basictaxonomy.

Paper IV: Plant physiology and Metabolism

On completion of the course, students are able to understand

1. Understand the Biochemical nature of cell.
2. Know the chemical nature ofbiomolecules.
3. Understand the different types of interaction inBiomolecules.
4. Structure and general features ofenzymes.
5. Concept of enzyme activity and enzymeinhibition.
6. Learn about the movement of sap and absorption of water in plantbody.
7. Understand the plant movements.
8. Know importance and scope of plantphysiology.
9. Understand the plants and plant cells in relation towater.
10. Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4pathways.
11. Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
12. Learn about the movement of sap and absorption of water in plantbody
13. Understand the plantmovements.

Semester- III

Paper-V: Cell biology, Genetics & Plant breeding

On completion of the course, students are able to:

1. The eukaryotic cell cycle and mitotic and meiotic celldivision
2. Structure and organization of cellmembrane
3. Process of membrane transport and membranemodels
4. Mendelian and Neo-mendeliangenetics
5. To study the phenomenon of dominance, laws of segregation, independent assortment

of genes.

6. To understand the different types of genetic interaction, incomplete dominance, codominance, inter allelic genetic interactions, multiple alleles and quantitative inheritanceetc.

Paper-VI: Plant Ecology and Phytogeography

On completion of the course, students are able to:

1. The students will understand the basic concepts of general geology, ecology and phytogeography.
2. learn about the analyze and basic principles of geology.
3. understand the importance of ecology and conservation
4. The students get to understand the basic concepts of geology, pedology, ecology, autecology, synecology, phytogeography and advanced ecology.
5. know the establishment of ecosystem, vegetation, plant succession and adaptations.
6. learn about carbon foot print, carbon sequestration, control of global warming, phytoremediation and disaster management.

Semester-VI

Paper VIIA: Organic farming and sustainable Agriculture

AnatomyOn completion of the course, students are able to:

1. The students will be able to understand the methods of plant breeding techniques.
2. To analyse and compare the organic and inorganic farming.
3. To understand the organic farming which does not totally exclude the elements of modern agriculture.
4. To prepare oneself for competitive / entrance examination (IFS, CSIR, UGC- NET/SET, etc.)
5. Knowledge of Mushroomculture

Paper VIIB: Nursery, Gardening and Floriculture

1. On completion of the course, students are ableto:
2. Gain knowledge about “Nursery techniques”.
3. Understand Floriculture techniques, seasonal flowers, growing techniques etc.
4. Learn the scope and importance of Nursery.
5. Understand the Gardening techniques, plants to be used in gardening depending on seasons, experimental plots to maintain gardens an nursery.

6. Understand the process of harvesting, marketing etc.
7. Understand the role nursery plants in humanwelfare.
8. Gain knowledge about various plants of economicuse of flowers.
9. Know importance of floral plants & plantproducts.
10. Understand the chemical contents of the nursery plantproducts.
11. Know about the utility of plantresources.

Paper-VIIC: Plant tissue culture and its biotechnological application

On completion of the course, students are able to:

1. The students will understand the basic concepts of genome organization in plants and molecular markers.
2. have a clear knowledge of plant tissue culture techniques
3. have a basic understanding of the plant genetic transformation methods.
4. be fully aware of the basics and applications of plant biotechnology.
5. Understand the basics of plant tissue culture.
6. Relate various gene transfer techniques in plants.
7. Gain knowledge in micro propagation techniques.
8. Acquire knowledge on secondary metabolite production
9. Comprehend the concepts of anther culture, embryo culture and microspore culture Culture the different types of cell lines
10. Acquire knowledge on techniques such as micropropagation, callus culture, somatic embryogenesis and synthetic seed technology
11. Identify new strains that can be used for commercial purposes and for industrial processes.

Dr.V.S.KRISHNA GOVT. DEGREE AND PGCOLLEGE (A.)
BLUE PRINT OF QUESTION PAPER

Botany Model Blue Print for the Question paper and choice for I, II & III Years (w.e.f. 2022- 23 Academic Year)

Question type	Unit I 12Hours	Unit II 12Hours	Unit III 12Hours	Unit IV 12Hours	Unit V 12Hours	Max. 75 Marks
Very Short Questions (Answer all questions)	1	1	1	1	1	5 x 2=10
Short Questions (3 out of 5 to be answered)	1	1	1	1	1	3X 5= 15
Essay Questions (Internal Choice)	2	2	2	2	2	5 X 10= 50